# ClearVision

PRESENTS

PERFORMANCE AT SCALE

A WHITE PAPER

Defining Performance at Scale

When we talk about performance at scale, it's often in relation to organisations undergoing rapid growth with a struggling software infrastructure.

In reality, ensuring performance at scale should be a major priority even for enterprise organisations that have been operating at a large scale for a long time. Even when your growth is relatively stable, you'll encounter challenges.

What do we take into consideration when we discuss 'performance at scale'?
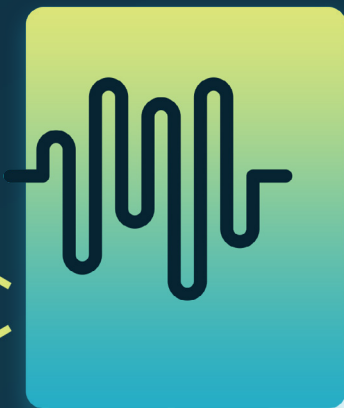
STABILITY

RELIABILITY

HIGH-AVAILABILITY

Ensuring performance at scale is particularly relevant to mission-critical apps.

Jira is essential to the teams that use it; as the #1 tool preferred by agile development teams, any downtime or performance problems are costly.

Jira Software

THE IMPACT OF DOWNTIME

1. Loss of revenue from delays to work.
2. Potential IT recovery costs.
3. Potential employee overtime to cover time lost.
4. Knock-on negative impact on staff productivity and morale.
5. Reputational damage.

When are performance issues likely?

It depends.

There's no one size fits all answer when it comes to issues of scaling and performance. It can depend on multiple factors, including:

- The setup of your infrastructure.
- The size of your teams.
- How your workflows are configured.
- What your requirements look like.
- How quickly your business is growing.

WHERE TO START WHEN IT COMES TO JIRA

Atlassian created the table below as a starting point on sizing guidelines for Jira.

Sizing legend	Small-scale	Mid-scale	Large-scale	Enterprise-scale
Application usage				
Users	100	500	2000	10000
Active (concurrent) users	25	200	600	2000
Issues	15000	60000	200000	1000000
Issues/month	200	1000	4000	20000
Custom fields	50	150	300	600
Permission schemes	3	15	25	100
Projects	20	80	200	300
Parent issue types	10	20	50	160
Resolutions	10	20	30	40
Priorities	10	15	25	40
Workflows	5	20	35	100
System level	Small-scale	Medium-scale	Large-scale	Enterprise-scale

Signs and causes of performance degradation

Many things can impact Jira's performance. Here's a rundown of some:

DATA SIZE

- Number of issues, comments and attachments.
- Number of projects.
- Number of Jira project attributes, e.g. custom fields, issue types, and schemes.
- The number of users registered in Jira and groups.
- The number of boards and issues.

USAGE PATTERNS

- Number of concurrent users.
- Number of concurrent operations.
- Volume of email notifications.

DEPLOYMENT ENVIRONMENT

- Jira version.
- Jira Server.
- Choice of database and connectivity to the database.
- Choice of OS, including local file storage, memory allocation, and garbage collection.

CONFIGURATION

- Number of plugins.
- Number of workflow step executions.
- Number of jobs and scheduled services.

This can lead to:

- **Increasing response times.**
- **Slow browsing.**
- **Offline periods.**
- **Unscheduled downtime.**

All of which can have a huge impact on your work.

Jira Data Center

It's the self-hosted, on-premise deployment option for the Jira Software your teams rely on every day. Running in whatever environment you prefer, Jira Data Center was designed for the enterprise, providing uninterrupted access and instant scalability.

HIGH-AVAILABLITY

Data Center brings you high availability through active clustering and automatic hot failover, with industry standard load-balancing, database clustering, and shared files systems
to minimise single points of failure.

Cluster multiple active servers to ensure uninterrupted access in the event of a hardware failure. If a node fails, the load balancer will automatically redirect users to another active node in the pool or cluster. Most users won't notice any downtime at all.
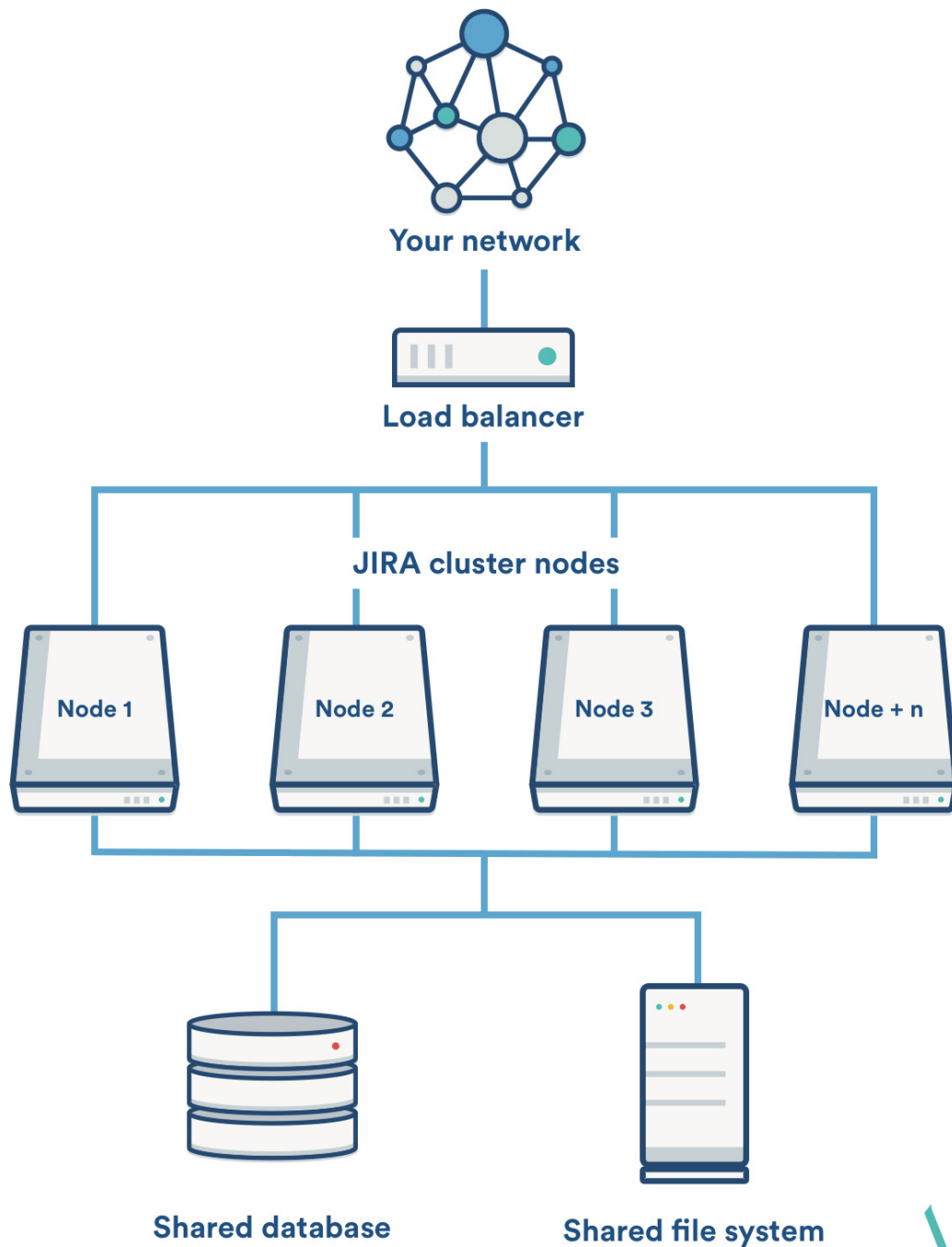
PERFORMANCE AT SCALE

Avoid performance degradation during load spikes by increasing application throughput.

Each node in a Data Center cluster increases capacity for concurrent users, so you can scale without sacrificing performance. Dedicate nodes in your cluster for automated tasks, or route certain types of traffic to specific nodes while driving the remaining traffic to others to provide the highest overall quality of service.

INSTANT SCALABILITY

Easily add new nodes to your Data Center cluster without any downtime or interruption to services. Existing nodes in the cluster will automatically sync indexes and plugins with each new member, meaning hassle-free deployment and maximum uptime.

It also makes it easier than ever to predict costs. Data Center is licensed by user count, so you can scale your environment without additional licensing fees for new servers or CPUs.

DISASTER RECOVERY

With Jira Data Center, you have the option for a 'cold standby' disaster recovery site for use in a complete system outage. This way, your disaster recovery site is located separately from production, and is only on when needed.

You may already have a disaster recovery strategy in place for your current Atlassian environment. DR will strengthen it. With Data Center, you're able to share application indexes from your production instance with your DR backup in addition to copying the database and shared storage folders. These indexes dramatically reduce the startup time of your DR backup in a failover eventuality.

Your network

Load balancer

JIRA cluster nodes

Node 1   Node 2   Node 3   Node + n

Shared database   **Shared file system**

Data Center deployment options are also available for Jira Service Management, Confluence, and Bitbucket.

⚡ Jira Service Management

🔲 Bitbucket   ⤫ Confluence

Diagram above: Jira Data Center architecture. Taken

from Atlassian documentation.

Governance at Scale

When it comes to scaling Jira Software, it's often the Jira Admins who are left dealing with the complications of managing such a widely used and important application.

One of the things teams love about Jira Software is that it's highly customisable. Customising Jira to your needs and requirements should always be a priority. This is how teams excel at what they do.

DID YOU KNOW?

Atlassian's analytics data show that nearly every customer dataset displays unique characteristics.

Within a large enterprise organisation, this can become unwieldy.

CUSTOM FIELDS

When it comes to using Jira at scale, it's not actually the number of issues or users that has the most immediate negative impact on performance; one of the biggest offenders comes from having many custom fields. This is especially true of free text custom fields.

The number of custom fields in Jira has a performance cost impact on actions that request or process custom issue details, which occurs practically everywhere such as viewing, searching, creating and editing issues, and adding comments. Whilst it has less of an impact on viewing dashboards and browsing projects, these can still become noticeably slower.
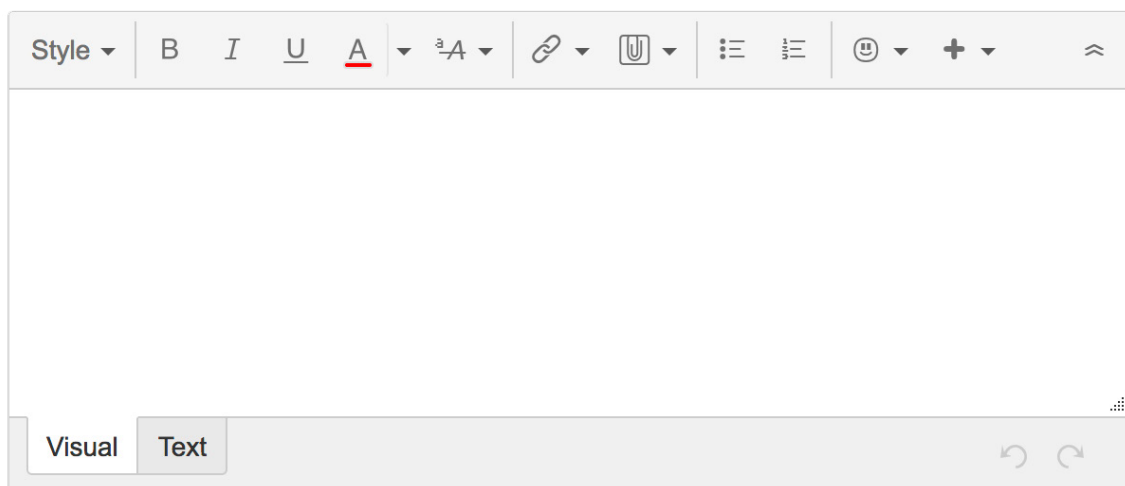
TIPS FOR EFFECTIVE GOVERNANCE

- Establish guidelines as early as possible - prevent problems before they occur.
- Create a workflow for handling user requests.
- Limit the number of modifications users can make.
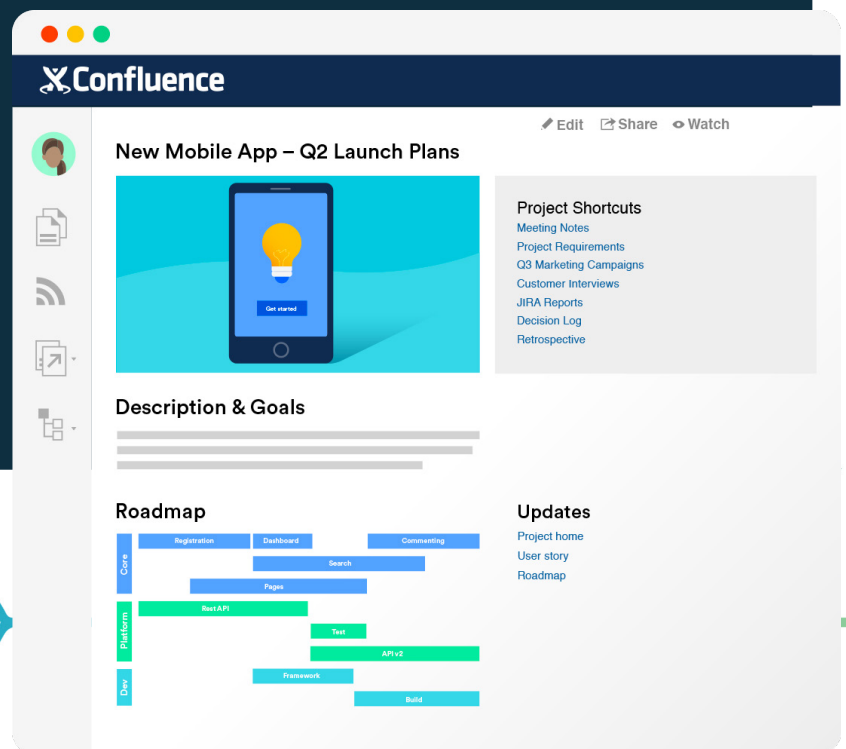- Reuse schemes where possible.
- Communicate rules and guidance clearly.

Good governance is about control while great governance is about guidance and competitive advantage.

Gartner.

Using Confluence?

A wiki like Confluence is the ideal place to communicate your rules and guidance for Jira usage. Create a dedicated space, and edit collaboratively to keep everyone up to date.

Confluence

New Mobile App – Q2 Launch Plans

Edit Share Watch

Get started

Project Shortcuts
Meeting Notes
Project Requirements
Q3 Marketing Campaigns
Customer Interviews
JIRA Reports
Decision Log
Retrospective

Description & Goals

Roadmap

Core: Registration, Dashboard, Commenting, Search, Pages
Platform: Rest API, Test, API v2
Dev: Framework, Build

Updates
Project home
User story
Roadmap

THE SECRETS OF
PERFORMANCE
AT SCALE

DEEP DIVE

Monitoring Jira

Because several factors have an impact on performance, monitoring is an essential part of ensuring peak Jira Data Center performance. Below are some steps Atlassian has outlined as a good starting point for monitoring your Data Center.

STEP 1

OS level monitoring on your active nodes will give you an idea of usage. Whilst the value of this level of monitoring will be limited to essentially RAM and CPU usage, it still paints a rudimentary picture of load. Because many organisations require hardware to perform within certain OS level thresholds. This is a great place to start in understanding the health of your system.

STEP 2

You should look into monitoring JVM and Tomcat applications. This will help you understand the load on your system and differentiate which processes are having what impact. Your Jira Data Center is likely to be running a number of processes in addition to general user traffic – API calls, automatic queries, dashboards, and plugins – which all tax your system in different ways. Using a JVM monitoring tool will help you understand the lifecycle of your load more specifically.

It's at this point you can really start to understand when it is appropriate to add hardware based on application usage.

Even monitoring tools won't necessarily identify nuances of usage, for example, who is making requests and the result on the quality of service. This is where log monitoring comes into play, both at the application and JVM level. Proactively consulting logs for data will help you understand what you are serving, to whom, and to what quality.

A combination of these three techniques will result in the most comprehensive view possible of the health and performance of your system.

Increasing performance - tweaking Apache and Tomcat

There are several possible suggestions on how to tweak Apache and Tomcat to boost performance in Jira. A starting point would be to match the allowed Tomcat threads to the reverse-proxy's thread number, and consider changing to a non-blocking connector in Tomcat.

Atlassian has a knowledge base article available for Confluence that also applies to Jira, with details on using Tomcat's NIO Connector to improve performance - view it here.
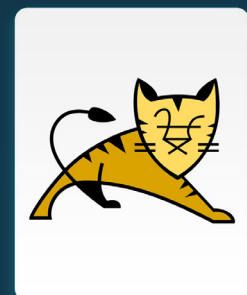
See Atlassian's documentation on scaling Jira >

Are you achieving performance at scale?

- Does your current Jira setup meet all of your needs and expectations?

- Does it perform to the standard your teams require?

- Is it time to upgrade to Jira Data Center?

- If your business has already upgraded to Jira Data Center, are you using it to its full potential?

As an Atlassian Platinum Solution Partner, Clearvision's consultants understand that you need tools that will enable and empower your teams. You need those tools to scale with you as you grow.

A Discovery engagement offers you the chance to work with our most experienced experts to evaluate your software setup. We take the time to understand your business needs, then make tailored recommendations, covering:

- Tools and integrations.
- Workflows and processes.
- Custom configurations.
- Agile methodologies.
- Deployment options.

Contact our experts.

Consultants

Clearvision

ATLASSIAN | Platinum
Solution Partner
ENTERPRISE